DOCUMENT RESUME

ED 433 837 IR 057 467

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TITLE	The Role of Libraries in a Changing Academic Environment.
PUB DATE	1999-05-00
NOTE	11p.; In: The Future of Libraries in Human Communication: Abstracts and Fulltext Documents of Papers and Demos Given at the [International Association of Technological University Libraries] IATUL Conference (Chania, Greece, May 17-21, 1999) Volume 19; see IR 057 443.
AVAILABLE FROM	Web site: http://educate.lib.chalmers.se/IATUL/proceedcontents/chanpap/skiadas.html
PUB TYPE	Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Academic Libraries; *Change; Foreign Countries; Higher Education; History; Information Sources; Information Technology; Librarians; Library Development; Library Personnel; *Library Role; Library Services; Technological Advancement
IDENTIFIERS	Europe; Greece

ABSTRACT

This paper traces the roots of higher education from Ancient Greece to the first universities in European countries where the idea of upper education became centered on the interactive dialogue between a teacher and student. The report discusses the role of the university library today in an age of ever-developing technologies and ever-increasing information sources. The paper suggests that the classic mission and function of libraries--to provide students and staff with information they need--has not changed, but the scope and techniques to fulfill this function have broadened. Discussion then moves to the concept of flexible delivery of services; changing roles of library staff; and the value of librarians in working in course development teams. The new skill base that will be needed by the staff of the digital library is then described, and characteristics of the information professional of the 21st century (based on a pre-conference seminary of the 1997 European Business Information Conference) are summarized. (AEF)

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THE ROLE OF LIBRARIES IN A CHANGING ACADEMIC ENVIRONMENT

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ED 433 837

The history of higher education (Ancient History)

The idea that education is something which people should pursue, even into their adult years, is not new. It extends well into the distant past. Every society has individuals who fulfill specialized roles, and some of these require an extended education. Sometimes these people are known as shamans, priests or teachers, and sometimes they are university professors, doctors, architects, or artists. In all of these examples, a form of education beyond the elementary is necessary. It may take the form of an apprenticeship, or intense private study or contemplation, or it may take the form of a formal higher education. Whatever the form, the purpose is the same: to perpetuate knowledge, and to extend it.

The idea of knowledge has been a part of every culture on Earth. However, almost every person alive has a different notion of what is useful knowledge and what useful knowledge should be passed on to younger people. What knowledge is worth preserving, extending, perpetuating, what knowledge is useless, even harmful? The history of higher education is essentially a history of choices, made on the basis of cultural imperative, politics, religion, need and precedent.

The knowledge accumulated by a culture is essentially bound to that culture, and seems to ebb with it. For instance, the knowledge of philosophy and natural science accumulated by the ancient Greeks seemed to crumble with their civilization, though it was later recovered in part, by various successive cultures. The technical expertise in road building, waste management and civic planning which the Roman civilization introduced, seems to have been lost when the empire collapsed, causing not only the loss of skills, but also a great deal of human suffering.

Knowledge is so closely connected to the culture from which it originates because it is transmitted through education, and education is essentially a cultural institution. Every civilization and culture has its own ideas of education.

Every civilization asks these questions:

- What should be taught and who should decide what should be taught?
- Who should teach it?
- What should not be taught?
- How long should education last?
- Who should be educated?
- What is the purpose of higher education?

These questions are as much a source of controversy now, as they were 5000 years ago. Our own notions of education, especially higher education, are grounded in Ancient Greece.

Back in the Old Days...

The Greek civilization began around the 6th century B.C. Learning and scholarships were intrinsic to the

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cultural make up of the ancient Greek World. Some of the names of Greek scholars are still well known today. Pythagoras, for instance, the mathematician who invented irrational numbers, lived in the ancient Greek world. He was born in 532 B.C. Euclid, known for his contribution to geometry (Euclidian geometry) was born in 300 B.C. Democritus, not so well known, lived in Greece in the 3rd century B.C. He was the first scholar that we know of to suggest an atomic theory of matter.

The most easily recognized names from this era are the names of the great philosophers: Aristotle, Plato, Socrates, etc. These people were the originators of modern Western scientific and philosophical thought. They also shaped western pedagogy, that is, the way we teach. They introduced a new way of dealing with problems. Socrates, though he personally did not write anything, which has survived, to modern times, was immortalized by Plato. He was an innovative pedagogue (teacher), who taught through a dialogic interaction with his students. In other words, he asked questions and they answered until they realized that they were wrong and he was right. Plato, his student and admirer, adopted the Socratic method and transcribed a series of "dialogues" which featured Socrates as a teacher and various young men as students.

The Academy
Plato was so impressed with the Socratic method of research and teaching, that he set up the Academy in 387 B.C., to perpetuate the method and direction of scholarship introduced by Socrates. It is commonly recognized as the **First University**, or **school of higher education**, in the history of the Western world. The Academy was actually quite informal by modern standards. It was just an area, set aside in the center of Athens, where students and masters could interact freely, discussing issues in the fields of philosophy and mathematics.

Aristotle was one of Plato's students and admirers. He came to the Academy in 387 B.C., and stayed for twenty years. He left when Plato died and traveled around the ancient Greek world, setting up similar institutions as he went. He was interested in a broad range of knowledge, including empirical science and anatomy as well as philosophy. He was the first to set standards for systematic scientific research, and **his ideas are the basis of modern scientific method**. Aristotle is also acknowledged as the founder of Logic, as a method of discourse and research, and as a field of inquiry. His other contribution to modern scholarship is the idea of dividing knowledge into separate fields, each with its own methodology and subject matter. In 335 B.C., Aristotle opened the Lyceum in Athens. This was the world's first polytechnic, devoted entirely to scientific research and training.

At the end of the Greek era, then, the **idea of upper education** was centered on the interactive dialogue between a teacher and student. **Questions and answers were at the very core of the education process**, as well as a way of directing research and systematizing it.

Ancient Greek Knowledge - How it Got to Us
The Greek civilization eventually lost its integrity and dominance in the Mediterranean area. With the loss of political power, it seemed that the vast body of knowledge, which the Greeks had amassed, would also be lost. So how did the ideas of Aristotle, Plato and Socrates filter down to us? **How did their concept of higher education come to have such strong and abiding effect on our modern institutions?** How did their culture attain an almost sacred status within our own? How is it that after two and a half millennia, we still feel compelled to imitate their architecture in our own institutions of higher learning, seats of government and law courts?

For one thing, the civilizations, which co-existed with the Greeks and sometimes even engaged in political and military conflict with them, did not fail to see the value and unique quality of their intellectual achievement.

The Romans, who conquered the Greeks, adopted the Greek curriculum for basic education. They moulded

and altered it to suit their needs, but left the basic fabric of it intact. The Romans had a more utilitarian approach to education than the Greeks, but they still stressed the disciplines which became the Liberal Arts. They felt that anyone who aspired to succeed in business or public life needed to be able to express himself effectively (women were not educated in anything beyond the scope of their future domestic duties), with style and eloquence. So, the Greek disciplines of grammar, rhetoric and dialectic - especially the first two - were considered indispensable to a young man's education. They used the Greek rules of debate to construct their legal system. To this day, Roman Law exists as a paradigm for much modern legal procedure. The Romans also modelled their arts and plays on the styles the Greeks had developed.

Alexandria, the last stronghold of Greek civilization and scholarship, was conquered by the Muslims in 642 A.C. The Arabs absorbed the amassed Greek knowledge, and proceeded to translate and interpret what they found at the **great library at Alexandria**. The translation and transliteration process was greatly sped up when, in 751 A.C., the Arabs took Chinese prisoners at the war of Samarkand, and **learnt to make paper** from them. **This meant that more people had access to books, so more people could be educated. It also meant that education was something that could take place everywhere**. The old manuscripts were made of vellum (animal skins) and didn't travel very well. The introduction of paper books meant that written materials were lighter and smaller and that education could become decentralized.

The Arabs set up universities, or schools of higher learning throughout their territory: in northern Africa at Nizamiyah and Mustansiriyah (in Baghdad), and in Spain at Cordoba, Seville, Toledo, Granada, Murcia, Almeria, Valencia and Cadiz. The schools were bound closely with the Muslim faith which, unlike early Christianity, embraced scholarship and learning and encouraged it for the greater glory of Allah. The early Arab universities taught vocational, professional and purely theoretical subjects. These included: algebra, trigonometry, geometry, physics, chemistry (in its early, alchemical manifestation) astronomy, medicine, logic, ethics, metaphysics, grammar, prosody (the study of poetic structures), law, jurisprudence and theology (Encyclopedia Britannica) They pursued active and systematical research in the areas of medicine, pharmacology, agriculture and pure sciences. The Arabs had assimilated knowledge from all the cultures they had been in contact with, whether by trade, military conflict or conquest. Thus the body of knowledge available to them included elements of the Zoroastrian culture of ancient Syria, Indian science and belief, Greek science and philosophy, as well as Chinese learning. All the Arab universities had reference libraries containing the translated works of all of these cultures.

During the early part of the second millenium, the Arabs were slowly expelled from Europe. The schools and libraries they had established fell into the hands of European Christians, who immediately set about translating the works of the Greeks, Indians and Arabs into Latin. Much of what we know about the writings of the ancient Greeks comes to us through this source. This was the basis of what is known as the 12th Century Renaissance, and set off a major revolution in scholarship and learning in Medieval Europe.

The First Universities

During the years of Medieval, in Europe, the first universities were being formed. **The first of the great medieval universities was established in 1088 at Bologna**. This school specialized in teaching Roman Law, which is the paradigm for all modern western codes of law. **In 1119 the University of Paris was founded**. This school became the model for most of the schools in northwestern Europe. The various colleges of Oxford opened between 1167 and 1185, but Cambridge was not established until 1209. Meanwhile, the old Arab universities were falling into the hands of Spanish and Italian Christians, and being converted into Christian schools.

The structure of the Medieval universities is reflected in the structure of modern schools. Back at the turn of the first millennium, schools of higher learning were supposed to be like small, liberal democratic states, protected by a papal or imperial `bull' - or law. Each university, though affiliated with the church, was self-governing and democratic. They were basically communities of scholars implanted into a host town,

and relations between the host community and the scholars were not always congenial. An argument between the students and towns' people in Oxford, for instance, escalated into a riot, and forced some of the students and faculty to flee the town, in fear for their lives. This incident precipitated the founding of Cambridge University. Nevertheless, the idea of community and collaboration was central to the formation of the schools which have evolved into modern universities. **Medieval universities contained the seeds of modern ideas of higher education**. For instance, academic freedom and autonomy were guaranteed by the self-governing status of these schools. The notion of neutrality, which has in recent years been questioned by rightwing governments as well as by post-modernism, was embedded in the writing of the ancient Greek scholars whose ideas were the backbone of Medieval curriculum. During this period, the Church was remarkably open-minded about the flood of new texts from the Arab Schools, and knowledge was restricted only by the availability of texts and translations.

Another interesting aspect of Medieval University life is that scholars moved around a lot. Universities were considered a sort of extended international community, and people would often begin a degree at one, then end it at another.

Renaissance' means `rebirth' and, in a way, this is exactly what happened intellectually in Europe in the 15th and 16th century. Various circumstances came together at this time which caused a change in people's basic thinking: a shift in economy involving greater prosperity, the discovery of new lands, the fall of Constantinople to the Turks. This last circumstance is of the greatest interest to us. The school of higher learning in Constantinople had a large library consisting of ancient Greek and Hebrew manuscripts. Many of the scholars fleeing from the Turkish invasion of 1453 took books with them into Europe. These manuscripts created a renewal, or rebirth of interest in classical philosophy and learning. The study of this knowledge was the work of the field of humanities.

Restrictions on Universities

There was, however, a basic shift in the way universities operated, from the Middle Ages to the Renaissance. During the Middle Ages, **universities were international**, connected to each other rather than their host communities or nations. Students and scholars often moved from one school to another. The Renaissance ushered in a period of nationalism in many countries in Europe. This was connected to the expansion of European culture through the acquisition of colonies. It was also connected with the religious conflicts between the Catholic and Protestant nations. Schools became more closely connected with their host states. They began to rely on them for funding, and were often quite strongly controlled by them. Queen Elizabeth I, of England, for instance, tried to control virtually all the operations of universities in England. She set a dress code for students and masters, and wanted to be in control of when lectures were scheduled, what degrees were granted to whom, and what was taught at the school, and what disputations were allowed.

On the continent, things were not much better. In the Catholic countries, especially Spain, the Inquisition kept a close eye on the orthodoxy of what was being taught at universities. Anyone who disputed or even questioned the church's doctrines could easily wind up being tortured until he confessed that he was in league with the devil -- then burnt at a stake. Naturally, universities in Spain became quite conservative. In other Catholic countries, the same attitudes towards new, or unorthodox knowledge were evident. Copernicus and Galileo both suffered from clerical persecution, and were kept from teaching their scientific findings. In fact, it was several centuries before the knowledge which they had uncovered was taught at any university. In the Protestant countries, things were only slightly better. In Leipzig, for instance, a whole faculty was fired and rehired as the religion of the ruling classes wavered.

As if the troubles of the universities weren't great enough, most of Europe was dealing with a period of rapid inflation. This meant that poorer students, who had worked their way through school in the past, could no longer afford to attend. At some schools, such as Heidelberg, even professors had a hard time

making ends meet. It also became apparent at this time that a new field of studies was emerging: the sciences. However, as always, universities were slow to accept this new idea, and lagged behind the world of scientific learning and research.

In our days... (Reinventing university libraries)
In our days, the rhetoric of student centered learning is slowly being fulfilled. New educational models are being implemented which adopt changing modes of teaching and learning. They incorporate the best of the traditional approaches but offer students much more freedom in choosing the time, location and manner of their learning. Digital technologies, and especially the World Wide Web (WWW), have made it possible to students to access library and information resources at any time of the day or night from their homes, workplaces and community libraries (provided adequate communications and computing infrastructure is available). Students can pursue courses on the Web, interact in formal or informal discussion/tutorial groups, contact their teachers, seek information, etc. Through these developments we are at the cusp of a great evolutionary fault line as we move to truly **open** learning, not just the correspondence college simulacrum we have enjoyed to date.

Early signs are that **this shift will change universities, and university libraries**, even more profoundly than the dramatic changes we have seen in the global banking industry through which, for example, many people can access their funds 24 hours a day almost anywhere in the world.

At this point I think, it is essential to establish a common agreed-upon understanding of them that will serve us, as basis. Therefore, in order to offer a common set of concepts, I present five basic definitions of the term library – as retrieved from the Collins Electronic Dictionary running on an IBM-compatible PC.

1. A room or set of rooms where books and other literacy materials are kept.
2. A collection of literacy materials, films, tapes, gramophone records, children's toys, etc., kept or borrowing or reference.
3. The building or institution that houses such a collection: a public library.
4. A set of books published as a series, often in a similar format.
5. Computer technol. A collection of standard programs and subroutines for immediate use usually stored on disk or some other storage device.

For hundreds of years, the university library has been at the center of research and scholarship. In many universities, it had a virtual monopoly in the provision of information resources to academic staff and students. Whilst, during the twentieth century, expanded interlibrary co-operation, and greater mobility of researchers, has broadened access to the resources of other libraries, to a great extent the mediation of libraries between users and information has remained.

The professionalisation in the exercise of the information profession is still accelerated by the influence of technology on tasks and functions on one side, and changing demands from information users. Technological (especially Information and Communication Technology 'ICT'), economical and social developments have changed the 'Information Space' in which libraries function and users retrieve information. The increase of the amount of information is still enormous. Information is offered on a still growing number of information media via more (electronic) channels than ever before. Now participant enters the information chain between author and user. Others expand their activities to other aspects of value adding and transfer and mediation of information.

At the same time users have access to information in ways that were restricted to 'professionals' until recently. For users **the library is no longer 'the' place to find information**. Internet enabled the retrieval of information that was reserved for 'librariáns' for a long time. To satisfy a user needs other and new forms of users instruction en support are necessary. As a result of this tasks in libraries change and with these the

list of demands to meet for the staff change. Classic tasks like collection building, cataloguing and indexing change and get another interpretation. We must distinguish between the primary process of the organization, the mission, and the processes that support en enable that primary process. **The primary mission of academic libraries in the 21st century will be the same as it has been ever since 'libraries' came into existence: to supply students and staff with the information they need**. The secondary process is the 'Trias Bibliotheca': collection building, cataloguing and indexing and supply. That means that **the classic function of libraries has not changed, but that the scope and the techniques to fulfill this function have broadened**.

Libraries are developing somewhere on the continuum between the 'Paper Library' and the 'Virtual Library'. In this process the accent shifts from attention for the information sources physical present in the institution to giving access to information for whoever wants it and in the format he/she wants it.

To fulfill the core mission successfully it is necessary that emphasis is given on (new) functions and skills like defining user needs, development of new products and services, users help, information analysis (quality control) and marketing of information products. Didactical and communicative skills and other ways of domain knowledge are important factors in this development. It is important that new developments in ICT skills are adapted and integrated in the relevant levels in the organization. Libraries are in a process of continuos and rapid development. This asks for an ongoing professionalization of the staff. Therefor the need and demand for additional learning is great.

In recent years, however, the introductions, and massive expansion, of electronic information sources, have led many to question this central mediating role.

So, what is, and will be in the future, the **core business of the academic library?** In the past, housing information artefacts, and making them available, was paramount. In the late twentieth century, in contrast, much of our information resource is not housed within the library building at all. In many cases, it is available via the Internet direct to the scholar's workstation. In such an environment, what roles do academic librarians have in the information chain? How can they provide added value?

Traditionally the core roles of academic library staff lay in acquiring, processing, and lending library materials and in responding to user generated information queries. Today, combinations of outsourcing and self-help mechanisms have replaced these previously "core" activities. Instead, **the academic library must focus on new "core" roles**. The modern university is typically involved in three interrelated fields - **teaching, research and community service**. The role of academic libraries, and of academic librarians, must be integrated into all these activities. If it is to ensure its continued relevance in the twenty first century, the academic library must turn from ownership mechanisms to access mechanisms, and from re-active to pro-active involvement in the academic processes of the university community.

Electronic access mechanisms, in particular the use of the Internet, are changing the mode of delivery of academic programs. The concept of **"flexible delivery"** is capturing much attention in many countries. Non traditional delivery of courses has, in the past, been focussed on distance education - provision of academic courses to students who are geographically distant, or unable, because of their personal circumstances, to attend on-campus lectures and tutorials. Traditionally, such courses were print based. The library supported this mode of learning by providing a mail-out service of books and photocopied articles on request, and by responding to student calls for information searching assistance.

Today, new course delivery modes are via the Internet - and such modes **are not restricted to "distance learners"**. The **new client** is a student with needs for more flexible study options, because of changing work patterns and lifestyles. He/she is as likely to be locally based as to be studying at a distance. Without pro-active intervention from academic librarians, such programs often provide only pre-packaged

information resources to support their coursework material. There is no requirement for the student to become involved in extended information research. Such limited approaches are educationally dangerous. This is so, not because they remove the need for provision of library services, much as librarians may lament this. Rather, it is because such forms of course delivery remove the need for students to develop critical information literacy skills - skills in locating, sifting, prioritizing and integrating information, in order to present a well documented argument, or a case taking account of current research. The student's capacity for life long learning is severely impeded by such restricted curriculum delivery formats.

Librarians, however, can retain an important contributory role within such new delivery modes. Increasingly, teaching staff are coming to accept that such forms of course development require specialist skills. Whilst teaching staff may rightly claim expertise in the subject discipline, many are willing to admit the need to work with specialist educational technologists in order to mount effective units/subjects on the World Wide Web (WWW). It is critical for educational outcomes that librarians ensure that they also become part of such teams, and that their roles as information content specialists are similarly recognized.

Academic librarians can no longer afford to sit in university library buildings, waiting for clients to seek them out. The librarian's skill must now be taken to the client. The place for an academic librarian in the future will be outside the Library building, actively involved with the academic community. Most university libraries have adopted the concept of **"liaison librarians"**, professional staff whose primary responsibility is to work with the staff of a particular faculty or academic department, in order to ensure that the information needs of the academic unit are being met by the library service.

In order to fully integrate itself into the academic process, the University Library will need to seek out opportunities to establish its value as a partner in course development and delivery. At many universities, each academic faculty maintains a Teaching and Learning Committee, which oversees matters relating to coursework programs. In almost all cases, the Library has succeeded in having key liaison librarians co-opted to join, and thus contribute to, such committees. As well, these librarians seek out, work with, and, at times join, course development teams which are constructing new courses for accreditation.

What value can librarians add to such teams? Certainly, provision of advice on how to locate resources to support program content is important (the "resource professional" role). However, equally important is the need to ensure that the way in which the curriculum is constructed encourages student research, information seeking, evaluation and synthesis, rather than simply feeding back specific data in rote fashion. As Coaldrake and Stedman recently commented in their book *On the brink: Australia's universities confronting their future:*

> "...the best education a person could receive would be one where they learned how to learn, ...this is far more important than learning particular facts or techniques. Universities which provide a stimulating, broad and challenging education, for young people in particular, should be highly valued"
>
> (Coaldrake and Stedman, 1998, p.42)

Teaching staff needs to be convinced that developing courses, which impart skills to facilitate further learning, is critical to any academic program.

In providing infrastructure support for the University of Future, the academic library's outreach activities can only be enhanced by operating in liaison teams beside IT support personnel and educational technologists. The skills of these three groups are today indispensable to the formulation of **flexible courses based on a combination of online, audiovisual and print technologies**. Support for the research activities of university staff and students can similarly benefit from input from such multi-skilled teams.

There exists in research, as in the teaching arena, a naive view that the skills of the academic librarian will in future become irrelevant, as unmediated information delivery becomes the norm. It is suggested that the academic will interact directly and effectively with her/his relevant sources of research information. Such views ignore the limited personal capacity of most teaching and research staff to manage the burgeoning floods of literature available electronically in every field. The need for skilled information navigators to guide, trains, and (at times still) to mediate for users, remains significant. Academic librarians should fulfil this role. Often, they will need to work with research clients individually. They will develop in-house specific subject gateways, adapt external gateways for best local use, seek out and advise on appropriate information resources (both print and URLs). In some ways they will act as faculty research assistants, but research assistants operating at a high professional level. The best self help mechanisms for resource users may well be developed in-house, whilst drawing heavily on globally available tools, such as international Internet subject gateways.

As resource constraints increase in most universities, the academic library will be able to fulfil its new mission only by a substantial re-orientation of its services. No longer are acquisition, cataloguing, lending and query response the key functions in such a mission. Through use of substantial process re-engineering, staffing requirements in these areas can be minimized. In fact, they must be minimized if the library's expanded role as educator, developer and information navigator is to be realized.

What is our new "core" business? The **"library without walls"** may not yet be an immediate physical reality. However, the increasing role of the academic librarian as a partner in the teaching and research process will be critical if the university library is to make the transition which will enable it to remain relevant and valued within its academic environment well into the twenty first century.

"New Skills Base"

The crucial issue as we move from library focus to direct electronic user focus in the next decade is the definition of the role of the librarian and information professional. Are we leaders, supporters, participants, supplicants or mere spectators in the inexorable process of globalization, uncertainty and information potential? Are librarians to be archival museum keepers, Internet subject content facilitators, webmasters, metadata creators, virtual university content providers, electronic publishers or entrepreneurs?

Such elements are a far cry from the requirement of say only two decades ago. Yet many of the middle to senior staff in our libraries were brought up in the more constrained environments of the role of the librarian. Can gradual change be introduced or should libraries go for the big bang?

The staff of the digital library will have to be flexible, project based, aware and that the scholarly communication environment is intrinsically unstable, if dynamic and demanding. Organization structures need to be reviewed to overturn innate print conservatism and to question historical assumption. (Tennant 1998) Contracts for staff may become more of a norm than "tenure". As funds decline in libraries these staff who can find and deliver the information, preferably with a value added component, will be rewarded.

Staff need to be well informed but the electronic era can provide a deluge of information (eg by institutional, national and global e-mail lists). Staff must provide their own filters and not become involved in "turf wars" which don't involve them. Staff can be useful catalysts by questioning activities and providing diverse views but may simply complain without offering rational or constructive alternatives. Weariness and overload exacerbate this process.

Some of the skills learning can be virtual, i.e. training courses available on the Net. Many of the library and information activities could be outsourced in the twenty first century as the diversity of skills is found wanting in one institution and labor costs are reduced by the use of global utilities. As important as a new

skills base is the important need for existing staff to change working habits and attitudes rather than simply complain that the world isn't what it was when they entered the profession.

Information Professional Characteristics

A pre-conference seminar of the 1997 European Business Information Conference the characteristics of the information professional of the 21st century are spelled out very clearly and no practising librarian would disagree with the KSAs (Knowledge Skills Ability) listed (EBIC, 1997). These are, in summary form:

Skills	Experience	Attributes	Behaviour
Information: collection, structuring, retrieval, filtering, analysing design.	**[pure] IT**	**Business focus**	**Confidence**
Communication: written, presentation	Communication	Team approach	**Influencing**
Skills transfer: training, coaching	General management	**Value ethos**	Sharing
Value added	**Information management**	People [customer] focus	**Skills transfer**
	Human relations	Leadershi	**Risk taking**
	Strategic planning	**Innovative**	**Identification with the business [or institutional aims]**
	Operations planning	**Understanding the potential of IT**	Listening skills
		Flexibility	**Understanding the issues and ability to judge relevance, quality and reliability**
		Adaptability	Networking
		Recognition of opportunity	

(New skills are in bold. People from the non-business sector may wish to question the business terms used in this list).

There is already a shortage of supply, a lack of people with the right combination of skills. The new roles for information and knowledge workers require people with ambition and drive, with business understanding and insight, with in-depth knowledge of IT applications and developments, as well as the more traditional skills of information management.

Conclusion

In the electronic environment libraries need to recognize that increasingly they are not the only game in town. Twenty four-hour online bookshops can provide reference services as well as information to the global information user. Superbookstores have in some ways replaced public libraries for the more affluent of our citizens. Academics can order books on line and can access information via subject gateways.

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Meyer (1997) has argued that libraries must broaden their understanding of what it is they do and must align their personnel policy to take the technologically adapt. His vision is that librarians who were "once cataloguers, book buyers and reference searchers, will become network managers, database integrators, fuzzy logic applicators and artificial intelligence experts, and graphical interface designers".
This may be a brave new world and it will not come about overnight but libraries and librarians in a digital world will have to rethink their roles as traditional boundaries, both intellectually and geographically, become blurred if they are to survive in the twenty first century.

To prepare for the future we need to be future prepared.

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Last edited by J.F. 21st June, 1999.